Amendments to the Claims

46. (Currently Amended) A system for chemically treating a surface of a workpiece comprising:

a supply of a transmission gas which is substantially nonattenuating to preselected wavelengths of electromagnetic radiation produced by said system;

a supply of a gaseous constituent;

an inlet structure for exposing the workpiece to a controlled gaseous atmosphere containing said transmission gas and for providing a flow of said gaseous constituent to the surface of said workpiece; and

a source of electromagnetic radiation adapted to converge a beam produced thereby in said flow in close proximity to the surface of the workpiece, but spaced a finite distance therefrom, to dissociate said gaseous constituent to produce a high flux of activated reactive species that chemically treats said surface of said workpiece.

47. (Original) The system of claim 46 further comprising optics to focus said beam.

48. (Original) The system of claim 46 further comprising a structure for causing relative motion between said surface and said beam.

49. (Original) The system of claim 46 further comprising a chamber for containing said workpiece and said gaseous atmosphere during said processing, said chamber having a window transparent to said electromagnetic radiation.

50. (Previously Amended) The system of claim 46 wherein said source of electromagnetic radiation produces ultraviolet radiation.

51. (Original) The system of claim 47, wherein said optics further expand a cross sectional dimension of said beam such that said beam convergence into a wide scanning beam.

52. (Previously Amended) The system of claim 46 wherein said finite distance is between approximately two and four millimeters above said surface of said workpiece.

53. (Original) The system of claim 49 wherein said chamber further comprising an exhaust pump for exhausting gas from said chamber.

54. (Original) The system of claim 46 wherein said inlet structure further comprises a nozzle connected to said supply of gaseous constituent to provide a laminar flow across the surface of the workpiece.

55. (Original) The system of claim 49 wherein said chamber further comprises a heater for heating the workpiece.

56. (Original) The system of claim 49 wherein said chamber further includes a workpiece temperature sensor for measuring the temperature of the workpiece during processing; a pressure sensor for measuring the pressure of gaseous atmosphere in the chamber during processing, and a gas sensor for monitoring the gaseous activated reactive species present in said flow.

57. (Original) The system of claim 46 further comprising a supply of a conditioning gas for modifying the chemical reaction between said activated reactive species and said surface of said workpiece, and a mixing chamber for mixing together said gas constituent and said conditioning gas.

58. (Previously Amended) The system of claim 57 wherein said supply of conditioning gas is selected from the group consisting of accelerant supply and decelerant supply.

60. (Original) The system of claim 48 wherein said structure further includes a holder for holding said substrate during said processing.

61. (Original) The system of claim 46 wherein said inlet structure is configured to provide the flow of gaseous constituent over the surface of the workpiece in the form of layer having a thickness of less than about 10mm.

62. (Original) The system of claim 46 wherein said inlet structure is configured to provide the flow of gaseous constituent over the surface of the workpiece in the form of a layer having a thickness that is at least large enough to accommodate said finite distance.

63. (Original) The system of claim 46 wherein said inlet structure is configured such that said transmission gas occupies a majority of said gaseous atmosphere and said flow of gaseous constituent is provided over the surface of the workpiece in the form of a layer occupying a minority of said gaseous atmosphere.

64. (Currently Amended) A system for treating a surface of a workpiece with electromagnetic radiation, said system comprising:

a first gas source configured to provide a transmission gas defined by a first radiation absorption coefficient;

a second gas source configured to provide a gaseous constituent defined by a second radiation absorption coefficient such that said gaseous constituent is more absorptive of said electromagnetic radiation than said transmission gas;

a chamber comprising:

a workpiece-containing portion; and

an inlet configured to establish fluid communication between said first and second gas sources and said chamber such that a gaseous atmosphere is defined therein, said gaseous atmosphere comprising a first region spaced from said workpiece surface and configured to accept said transmission gas, and a second region disposed between said first region and said workpiece surface and configured to accept said gaseous constituent; and

an electromagnetic radiation source configured such that upon operation of said electromagnetic radiation source, a beam produced thereby converges in said second region in close proximity to, but not on, said workpiece surface to dissociate said gaseous constituent into an activated species that ~~chemcially~~chemically reacts with said workpiece surface.

65. (Previously Presented) The system of claim 64 wherein said inlet is configured such that during operation of said system, flow of said transmission gas and said gaseous constituent in said first and second regions is laminar.

66. (Previously Presented) The system of claim 64 wherein said first gas source is configured to supply gas selected from the group consisting of helium, neon, argon, nitrogen and combinations thereof.

67. (Previously Presented) The system of claim 64 wherein said second gas source is configured to supply gas selected from the group consisting of O_2, O_3, CCl_4, BCl_3, CDF_3, CF_4, SiH_4, $CFCl_3$, F_2CO, $(FCO)_2$, SF_5NF_2, N_2F_4, CF_3Br, CF_3NO, $(CF_3)_2CO$, CF_2HCl, CF_2HBr, CF_2Cl_2, CF_2Br_2, CF_2CFCl, CF_2CFH, $CF_2CF_2CH_2$, NH_3, CHF_3, fluorohalides, halocarbons and combinations thereof.

68. (Previously Presented) The system of claim 64 wherein said electromagnetic radiation is of a predetermined wavelength.

69. (Previously Presented) The system of claim 68 wherein said predetermined wavelength is between approximately 190 and 250 nanometers.